DD-475

M. Sc. (Second Semester)
EXAMINATION, May/June, 2020

COMPUTER SCIENCE

Paper Fourth

(Principle of Compiler Design)

Time : Three Hours

Maximum Marks : 100

Note : Attempt any *two* parts from each question. All questions carry equal marks.

1. (a) What are the phases of a compiler ? Explain the functions of each phase.

   (b) Construct parse tree and syntax tree for the statement $A = B + C* D/F$.

   (c) When you say that grammar is ambiguous ? Show that the grammar $E \rightarrow E + E|E*E|(E)|a$ is ambiguous.

2. (a) Check whether the grammar $S \rightarrow iEtS|iEtSeS|a$, $E \rightarrow b$ is a LL (1) grammar. Also define the FIRST and FOLLOW procedures.

   (b) Construct DFA for the regular expression $ab (a + b)*$.

(c) Explain the role of Symbol table in compilation. What are the entries that are stored in symbol table ?

3. (a) Translate the arithmetic expression a + (b + c)/d into quadruples, triples and indirect triples.

(b) How is memory allocation done for structure and how can they accessed ? Explain with an example.

(c) What is activation record ? Explain different fields in activation record.

4. (a) What are the standard storage allocation strategies ? Explain them in detail.

(b) What are the different types of error detected during compilation ? Give *five* different types of error detected with examples.

(c) Write short notes on the following :

(i) IOSUB

(ii) File Control

5. (a) What are the major issues to be considered for code optimization ?

(b) Explain global data flow analysis.

(c) Explain with example the following terms :

(i) Constant folding

(ii) Induction variable elimination

(iii) Copy propagation